

which a perfectly preserved ligament was found, is very similar to *T. deltoidea*, differing mainly in being less inflated, more elongate, and in having more pronounced radial sculpture.

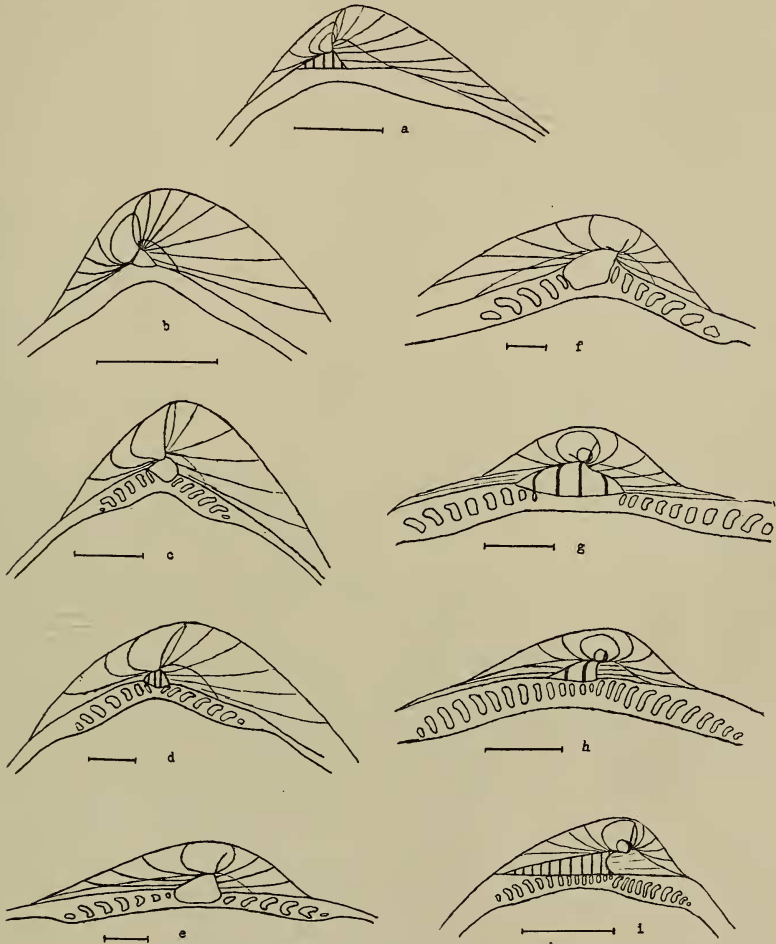


Fig. 1.—a. *Linter acutata* Stephenson. b. *Trinacria cor* Popenoe. c. *Trinacria deltoidea* (Lamarek). d. *Trinacria media* (Deshayes). e. *Trinacria meeki* Dall. f. *Trinacria pectuncularis* (Lea). g. *Halonanus (Trinacriella) cossmanni* (Dall). h. *Halonanus (Trinacriella) perplana* (Conrad). i. *Halonanus pulchra* (Gabb). The lengths indicated by the straight lines below the individual figures are over-all dimensions of the shell, natural size.

Remnants of the fibrous layer have also been observed in specimens of *T. media* (Deshayes) (Fig. 1d, Bartonian, Ezanville, France), a species closely related to *T. ledoides* (Meyer) from Claiborne. In these specimens the ligament material is somewhat disarranged but three ligament grooves are quite clearly indicated on one specimen.

This species is more elongate than *T. deltoidea* and the beaks are more orthogyrate. The umbonal ridge is not sharply carinate but sharply rounded and approaches that of *T. crassa* (Deshayes), the genotype, in which the umbonal ridge is definitely rounded in adults. *Trinacria media* and *T. crassa* approach the Miocene species from Florida, *T. meeki* Dall (Fig. 1e), in the rotundity of the umbonal ridge but differ in being more trigonal and in that the rows of teeth are not widely separated as in the latter. In *T. meeki* the umbonal ridge is broadly rounded in adults and the beaks have returned to a nearly orthogyrate attitude. The base of the ligament is more expanded. *Trinacria meeki* might be regarded as subgenerically distinct from typical *Trinacria*, but it seems just as satisfactory to regard it as a terminal species of the genus. *Trinacria pectuncularis* (Lea) (Fig. 1f) from Claiborne has a moderately expanded, somewhat anteriorly directed ligament pit and separated rows of teeth, but differs from *T. meeki* mainly in being higher and subquadrate rather than elongate and subovate.

In addition to the typical species of *Trinacria* found in the Claiborne group of the southeastern United States there exist two other groups of shells that appear closely related to them. It will be difficult to discuss these forms specifically until they have been monographed, but they are typified by *Noetia pulchra* Gabb (Fig. 1i) from Texas, for which the generic name *Halonanus* (5) has been proposed, and *Pectunculus perplanus* Conrad (6) from Claiborne; and *Trinacria perplana* (Conrad) Harris (7) (Fig. 1h) for which the subgeneric name *Trinacriella* is here proposed under the genus *Halonanus*.

*Trinacriella* ranges in shape from subquadrate to subelliptical or subovate, some forms being nearly circular. Aside from the difference in shape it is distinguished from *Trinacria* by its heavier shell and wider cardinal plate. The widening of the cardinal plate enabled the anterior and posterior rows of teeth to reestablish contact with each other and a series can be seen ranging from *T. cossmanni* Dall (Fig. 1g), in which the rows are well separated, to *T. perplana* (Conrad) (Fig. 1h) in which they run together. In addition the ligament pit exhibits a series ranging from nearly equilateral in *T. cossmanni* to more anteriorly directed as in *T. perplana* and *T. ellipsis* (Lea). The former pattern is regarded as aberrant whereas the latter bears resemblance to that of some species of *Trinacria*, especially the Claiborne species *T. pectuncularis* (Lea), through which the two genera may be connected. The ligament pattern of *T. perplana* also approaches that of typical *Halonanus*.

*Halonanus* differs from both *Trinacria* and *H. (Trinacriella)* in being definitely noetiform with a well developed cardinal area, although *H. decisa* (Conrad) (not figd.) appears to be intermediate between the typical form and *Trinacriella perplana*. *Halonanus* differs from the Noetinae in that its sculpture consists of only one set of ribs whereas the Noetinae are characterized by both primary and secondary ribs. Its ligament differs from that of *Noetia* in that in that genus there is an initial vertical element beginning directly beneath the umbo whereas in *Halonanus pulchra* there is an initial anterior diagonal groove which later develops into a vertically striated ligament. This condition has been observed nowhere else among the prionodont bivalves and is accounted for by the fact that the cardinal area of *Halonanus* is a secondary structure analogous to the primary cardinal area of *Linter*, the initial anterior diagonal ligament groove being a remnant of the anteriorly directed ligamental pit observed in *Trinacriella* and still well developed in *Halonanus decisa*. The ligament material is usually lost in specimens of *Trinacriella* and *Halonanus decisa* but a few specimens seen by the writer retain enough to show that the ligament contained vertical elements, even in the forms with more oblique pits. The secondary cardinal area of *Halonanus*, *sensu stricto*, is foreshadowed in the incipient cardinal area observed in some species of *Trinacriella*, particularly *T. perplana*.

#### CLASSIFICATION<sup>2</sup>

A partial classification of arcid Pelecypoda to include the subfamily Trinacriinae follows. This arrangement is based primarily on ligament structure but is correlated with dentition, orientation, sculpture, and other shell characters.

- Order FILIBRANCHIA Pelseneer  
 Suborder PRIONODONTA MacNeil  
 Superfamilies CYRTODONTACEA, PARALLELODONTACEA,  
 GLYCYMERACEA, ARCACEA  
 Superfamily GLYCYMERACEA MacNeil  
 Families GLYCYMERIDAE, CUCULLAEIDAE, NAVICULIDAE,  
 LIMOPSIDAE, NOETIDAE

The superfamily Glycymeracea exhibits much less stability in ligament structure than the Parallelodontacea and Arcacea, and most of the aberrant types of ligaments are found here. It is interesting to note that all

<sup>2</sup> This classification is based on *Arca antiquata* as type of *Arca*. If the Commission should accept a recommendation before it at the present time to regard *Arca noae* as type, the following changes would become necessary: *Glycymeracea* would become *Arcacea*; *Arcacea* would become *Anadaracea*; and *Naviculidae* would become *Arcidae*.

opisthogyrate shells and all shells bearing a flange on the muscle scars fall in this superfamily.

### Family NOETIDAE MacNeil

Subfamilies STRIARCINAE, TRINACRIINAE, NOETINAE

The family Noetidae includes all of the forms having vertical ligament elements.

#### Subfamily TRINACRIINAE MacNeil

This subfamily includes the three genera, *Linter* Stephenson, *Trinacria* Mayer, and *Halonanus* Stewart, and the subgenus *Trinacriella* MacNeil (under *Halonanus*).

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PALEOBOTANY.—*On the presence of the fern Weichselia in Colombia, South America.*<sup>1</sup> EDWARD W. BERRY, Johns Hopkins University.

Some months ago I received from Phillip L. Merritt, under the label of the Ministerio de Industrias y Trabajo, Bogota, Colombia, a package of fossil plants. These were collected near Mutiscua, which is between 10 and 11 miles slightly south of west of Pamplona in the northern part of the Department of Santander, and is shown on Hettner's map of the Cordillera of Bogotá.<sup>2</sup>

This material is of considerable interest and comprises 6 specimens which are covered with the impressions of the rachis and fronds of the fern known as *Weichselia*, which was almost world-wide in its distribution during the Mesozoic. The matrix is a rather soft, grayish mudstone, very similar to the shales on the Island of San Lorenzo, off the port of Callao, Peru, which are also packed with *Weichselia*, the only apparent lithologic difference being that the shales from Peru are slightly lighter in color.

The Colombian matrix has not been studied petrographically, but from its somewhat soapy feel, and its general similarity to that containing the Peruvian fossils, I regard it as probably representing a carbonaceous pyritiferous mudstone in which, because of tectonic

<sup>1</sup> Received August 23, 1937.

<sup>2</sup> HETTNER, ALFRED. *Die Kordillere von Bogotá*. Petermann's Mitt. Ergänzung Bd. 22, No. 104, 1891.



movements and circulating waters, the carbon and the sulfide were oxidized.

The plant impressions are typical of *Weichselia*, the larger frond fragments showing a stipe of about 3.5 millimeters diameter, and elongated parallel pinnae of lengths up to 10 or 11 centimeters, with the characteristic netted venation of the pinnules frequently in excellent preservation. Associated with the frond fragments are impressions of the sort that have often been interpreted as stems of *Equisetites*, as by Neumann, Schlagintweit, and others, which Zeiller considered, in the case of the Peruvian material, as the larger stems or petioles of *Weichselia*. Impressions of this sort, indistinguishable from the Peruvian material, are associated with the frond fragments in the present collection in lengths of about 11 centimeters, and with diameters of 2.5 to 3 centimeters.

The impression material of this frond genus, first described as a species of *Pecopteris* by Stokes & Webb in 1824, and named by Stiehler in 1857, is rather readily recognizable, and has been discovered in many parts of the world. It has been discussed by many authors, the bibliography amounting to upwards of fifty titles. In the latest discussion, that by Edwards in 1933, a rather good case is made out for correlating the impressions known as *Weichselia* with the structural material of stems, or more probably petioles, which have been described under the name of *Paradoxopteris*.<sup>3</sup> Despite all the available evidence and this correlation, the botanical affinity of *Weichselia* is not settled beyond a strong presumption that it is to be found in the family Marattiaceae, or in an allied and wholly extinct group.

A number of different species of *Weichselia* have been proposed. In describing the Mesozoic flora of Peru I followed Zeiller in using the specific designation *Weichselia peruvianum*,<sup>4</sup> which was based in the first instance on the impressions of large petioles which Neumann had mistakenly described as *Equisetites peruanus*. Although I saw no fertile specimens from Peruvian localities such as Zeiller thought he had, I considered that the reflexed basal pinnules might serve to differentiate the Peruvian from the European material. Edwards has shown, however, that this feature occurs also in some specimens of the European genotype *Weichselia reticulata*.

In spite of the lack of definite distinguishable characters I find it

<sup>3</sup> EDWARDS, W. N. *On the Cretaceous fern Paradoxopteris and its connection with Weichselia*. *Annals of Botany* 47: 317-341. 1933.

<sup>4</sup> BERRY, E. W. *Johns Hopkins Studies in Geology* 4: 52-55. 1922.

hard to believe that a single botanical species ranged over five continents—Europe, Asia, Africa, North and South America—and from at least the dawn of the Lower Cretaceous<sup>5</sup> to the Cenomanian stage of the Upper Cretaceous. Peruvian material was recorded in 1922 from ten different localities, and subsequently in the collections made by the Ellsworth Expedition from the coal measures of Huallanca in the Department of Ancachs, this species was found to be exceedingly abundant.

I may add that the North American occurrence of *Weichselia* in the Black Hills, about which I expressed some doubt in 1922, is perfectly authentic. I have since had a large amount of typical but very fragmentary material from that region.

Karsten, years ago, collected *Weichselia* at Santa Maria in north-eastern Venezuela. This find was discussed by Schlagintweit<sup>6</sup> who concluded that its age was Neocomian. From Santa Maria through Mutiscua via the Andean geosyncline to the southernmost of the abundant Peruvian occurrences is a distance of about 2,500 miles. Occurrences of this species in Texas and in the Black Hills region of South Dakota carry its range northward to 44° north latitude, so that its known north-south range in the western hemisphere covers about 55° of latitude.

Regarding the exact age of the new material from Colombia no conclusion based upon paleobotanical evidence is possible. The European type is more common at Neocomian and Barremian horizons than later in the Cretaceous, but according to Edwards it ranges up through the Aptian to the Albian (upper Greensand) in England. In eastern Asia an Aptian age is supposed, and some of the north African occurrences have been regarded as Cenomanian. The Black Hills occurrences in North America are associated with a dicotyledonous flora and have been regarded as of Albian age. All that can be said of the age of the Mutiscua specimens is that they are probably Lower Cretaceous, but whether early or late in that period can not be determined, although, if the Peruvian occurrences have any weight, which is by no means certain, the balance of evidence would point to an earlier rather than a later Lower Cretaceous age.

Schuchert's map of the early Lower Cretaceous in the Caribbean and northern South America shows no seaway on the site of the

<sup>5</sup> The horizon of the Peruvian material in the Department of Lima has been incorrectly termed Wealden. It is considered by Peruvian geologists to be Neocomian, but it may well be as old as Portlandian. Probably Tithonian would be the proper designation.

<sup>6</sup> SCHLAGINTWEIT, O. Centralblatt f. Min. Geol. & Pal. 19(20): 315-319. 1919.

Venezuelan Andes, such a seaway first appearing on his map of the early Middle Cretaceous, whatever that may mean.<sup>7</sup> It is, of course, impossible to criticize such generalized maps covering such synthetic geologic time, but it is certainly a fact that Lower Cretaceous is present throughout the extent of the Venezuelan Andes from Colombia eastward to Trinidad.

ZOOLOGY.—*The Nearctic spiders of the family Heteropodidae.*<sup>1</sup>

IRVING FOX, Iowa State College, Ames, Iowa. (Communicated by C. F. W. Muesebeck.)

The spiders of the group under discussion are generally held to comprise a distinct family having affinities with the Thomisidae and the Clubionidae; from the former they are distinguished particularly by the possession of teeth on the cheliceral margins and from the latter chiefly by the laterigrade legs and the more or less distinct membranes at the apices of the metatarsi. They are further characterized by the possession of a carapace which is as wide as long or slightly longer than wide, and by the scopulate tarsi which are armed with two claws. The eyes are eight in number and arranged in two transverse rows of four each.

The conception that these characters are of sufficient importance to warrant the maintenance of a distinct family is generally subscribed to by modern arachnologists, but there yet exists some disagreement concerning the proper family denomination. Two names have been commonly used, Heteropodidae Thorell and Sparassidae Simon; the former name appears to be the correct one. Thorell in 1873 suggested that *Heteropoda* and related genera be separated from the Thomisidae and combined into a new family, Heteropodidae.<sup>2</sup> In 1874 Simon revised the European species of this group under the family name Sparassidae,<sup>3</sup> and this and subsequent revisions had the effect of making Sparassidae the more extensively used name. On the basis of priority, however, Heteropodidae is the correct family name and Sparassidae is its synonym.

There is evident considerable confusion among authors concerning the proper usage of the names, *Sparassus*, *Olios*, and *Eusparassus*. The genus *Sparassus* was erected by Walckenaer in 1805,<sup>4</sup> and *S.*

<sup>7</sup> SCHUCHERT, CHARLES. *Historical geology of the Antillean-Caribbean region*, maps 4 and 5. 1935.

<sup>1</sup> Received August 18, 1937.

<sup>2</sup> *Remarks on the Synonyms of European Spiders*, Upsala, p. 606, 1870-1873.

<sup>3</sup> *Ann. Soc. Ent. France* 4: 243. 1874.

<sup>4</sup> *Tableau des Araneides*, p. 40, 1805.

*argelasius* Walck. was subsequently designated as type by Thorell.<sup>5</sup> *S. argelasius* was re-described by Walckenaer in 1806,<sup>6</sup> by Latreille (under *Micrommata*) in 1818,<sup>7</sup> and again by Walckenaer in 1837.<sup>8</sup> Simon considered *S. argelasius* Walck. 1805 to be a *nomen nudum* and accepted *M. argelasius* Latreille 1818 as the earliest available name.<sup>9</sup> At the same time he decided that *M. argelasius* Latreille represented a group distinct from any previously described and made it the type of his new genus *Eusparassus*. Since publication of these views Simon's arrangement has been generally accepted, and *Eusparassus* has been considered a good genus, while *Sparassus* has been completely ignored.

Walckenaer's original description of 1805, while not detailed enough to permit recognition of the species, is sufficient to constitute a valid description, hence *S. argelasius* Walck. 1805 can not correctly be regarded as a *nomen nudum*, but must be considered a valid name. Latreille in his description of 1818 indicated conclusively that he was re-describing Walckenaer's species rather than describing a new one of his own, and further states that the species was recognized by Walckenaer as his *argelasius*. If the species that Latreille described in 1818 was different from the one described in 1805 by Walckenaer, as Simon apparently believed, the later name rests upon an error of identification and is invalid under Article 31 of the International Rules of Zoological Nomenclature. Since Latreille expressly states that Walckenaer recognized the species as the one he himself had described, there seems to be little reason to assume that Walckenaer's descriptions of 1805, 1806, and 1837, and Latreille's of 1818 do not refer to the same species. From this discussion it is apparent that the genus *Sparassus* Walck. is available and has as a synonym *Eusparassus* Simon; its type is *Sparassus argelasius* Walck., which name is to be used for the not uncommon European species now known as *Eusparassus argelasius* (Latreille).

The genus *Olios*, as it was originally described by Walckenaer in 1837 included an extremely heterogeneous assemblage of several genera. In 1880 Simon restricted it to the species congeneric with *O. spongitaris* (Dufour) which he selected as the type.<sup>10</sup> He also indicated that *Sparassus argelasius* Walckenaer 1805 was the same as

<sup>5</sup> Nova acta. Reg. Soc. Sc. Upsaliae 7: 176. 1869-1870.

<sup>6</sup> Histoire Naturelle des Araneides, facie. 4: fig. 2. 1806.

<sup>7</sup> Nouveau Dictionnaire d'Histoire Naturelle 20: 516. 1818.

<sup>8</sup> Histoire Naturelle des Insectes Aptères 1: 584. 1837.

<sup>9</sup> Histoire Naturelle des Araignées 2: 1020. 1903.

<sup>10</sup> Act. Soc. Linn. Bordeaux 34: 297. 1880.



Dufour's species, yet he retained the later name. Subsequent authors were divided in their usage of the names *Olios* and *Sparassus*, some considering *Olios* a good genus, while others reasoned that since *O. spongitaris* (Dufour), the type of *Olios*, was a synonym of *S. argelasius* Walck., the type of *Sparassus*, then *Olios* was a synonym of *Sparassus*.<sup>11</sup> However, Simon in 1903 stated that the previous synonymization of *O. spongitaris* (Dufour) with *S. argelasius* Walck. was entirely gratuitous, as Walckenaer's original description was too brief to permit identification. On this account *Olios* is, in the present paper, regarded as the proper name for the species related to *spongitaris* Dufour, while *Sparassus* is applied to the *argelasius* Walckenaer group.

The following pages are concerned with only the nearctic species of Heteropodidae; three new species and a new genus are described, and keys to the nearctic genera and species are given. The family is represented in the United States by three genera of which two, *Tentabunda* and *Heteropoda*, contain but one species, while the third, *Olios*, comprises six species.

I wish to express my appreciation to the authorities of the United States National Museum for the courtesy shown me while studying the collections in their charge. I am deeply obliged to Miss Elizabeth B. Bryant of the Museum of Comparative Zoology, to Dr. W. J. Gertsch, and Mr. H. K. Wallace of the American Museum of Natural History, and to Professor R. V. Chamberlin of the University of Utah for their generosity in lending material for study.

KEY TO THE NEARCTIC GENERA OF SPARASSIDAE

- 1. Spinnerets set upon a distinct basal segment . . . . . *Tentabunda*  
 Spinnerets normal, not set upon a distinct basal segment . . . . . 2
- 2. Anterior median eyes as large as or larger than the anterior lateral.  
     Clypeus much lower than the diameter of an anterior median eye. . . . . *Olios*  
     Anterior median eyes smaller than the anterior lateral. Clypeus higher than the diameter of an anterior median eye. . . . . *Heteropoda*

TENTABUNDA, n. gen.

A genus in the subfamily Sparianthidinae. Cephalothorax robust, longer than wide. Eyes in two rows, with the anterior row straight or slightly procurved, the posterior row very procurved and broader than the anterior. Anterior median eyes slightly larger than the anterior lateral; posterior eyes subequal or with the posterior lateral eyes slightly larger than the posterior median. Median ocular quadrangle wider than long. Clypeus equal in height

<sup>11</sup> CAMBRIDGE, F. *Biologia Centrali-Americana* 2: 122. 1905.

to at least more than half the diameter of an anterior median eye. Lower cheliceral margin armed with six or seven small denticles, upper margin armed with three or four robust teeth. Anterior tibiae provided with 2-2-1 or 2-2-2 spines below; anterior metatarsi provided with one pair of spines below. Spinnerets six in number, set upon a distinct common basal segment.

*Genotype*.—*Pseudosparianthis cubana* Banks, 1909, known from Cuba and Florida.

**Tentabunda cubana** (Banks), n. comb. Figs. 5 and 11

*Pseudosparianthis cubana* Banks. Second Rep. Centr. Exper. Sta. Cuba, p. 165, pl. 45, fig. 4, 1909.

*Pseudosparianthis cubana* Bryant, Bull. Mus. Comp. Zoo. Cambridge, 74:192. 1933.

*Female*.—Total length, 10.69 mm. Carapace, 5.45 mm long, 3.86 mm at the widest place, 2.77 mm wide in front. Abdomen, 5.25 mm long, 2.97 mm wide. Carapace uniform reddish brown above without distinct markings, clothed with sparse pubescence. Sides concolorous with the dorsum, lacking distinct submarginal stripes. Chelicerae dark brown, much darker than the carapace. Sternum and coxae light yellowish brown, labium and endites reddish with white distal patches. Legs clear light yellow below and reddish above, without annulations. Dorsum of the abdomen with a grayish ground color upon which is a dark pattern consisting of a series of six or seven chevrons continuing to the spinnerets. Venter much lighter than the sides being light gray with sparse dark punctations. Spinnerets six in number, set upon a distinct common basal segment.

Anterior row of eyes slightly procurved, narrower than the very procurved posterior row (17/21). Anterior median eyes slightly closer to each other than to the anterior lateral and somewhat larger than the latter. Eyes of the posterior row subequal and equidistant, separated by more than two diameters. Median ocular quadrangle wider than long (18/15), narrower in front than behind (16/18), the posterior eyes about four-fifths as large as the anterior. Clypeus equal in height to about four-fifths the diameter of an anterior median eye. Chelicerae, 2.07 mm in length, lower cheliceral margin armed with seven small denticles, upper margin armed with four robust teeth. Tibiae I and II with 2-2-1 spines below, metatarsi I and II armed with one pair of spines below. Tibia and patella I, 6.24 mm long (tibia alone, 3.96 mm); tibia and patella IV, 5.25 mm long (tibia alone, 3.47 mm).

Epigynum wider than long (25/20), anteriorly provided with a wide atrium from which a distinct median suture extends posteriorly dividing the caudal portion of the epigynal plate into two equal halves. For further details regarding the structure of the epigynum see Fig. 5.

Described from a female specimen collected by T. H. Hubbell fourteen miles west of Palm Beach, Florida, October 29, 1934 and in the possession of the American Museum of Natural History.

*Male*.—Total length, 7.00 mm. Carapace, 3.56 mm. long, 3.27 mm at the widest place, 1.68 mm wide in front. Abdomen, 3.56 mm long, 2.48 mm wide. Carapace lighter than in the female, being yellowish rather than reddish and having a sparser pubescence. Chelicerae light yellowish brown, concolorous with the carapace. Sternum, coxae, labium, and endites whitish without distinct markings. Legs clear, concolorous with the sternum below, above yellowish and concolorous with the carapace. Dorsum of the abdomen as in the female, but in general somewhat lighter.

Anterior row of eyes slightly procurved, narrower than the very pro

curved posterior row (12/14). Eyes of the anterior row subequidistant with the anterior median slightly larger than the anterior lateral. Eyes of the posterior row subequal and equidistant, separated by about one and one-half diameters. Median ocular quadrangle wider than long (14/12.5), narrower in front than behind (12/14), the posterior eyes about four-fifths as large as the anterior. Clypeus equal in height to about four-fifths the diameter of an anterior median eye. Chelicerae, 1.19 mm long; lower cheliceral margin armed with seven small denticles, upper margin armed with four robust teeth. Tibiae I and II with 2-2-2 spines below, metatarsi I and II with one pair of spines below, and unlike the female with a basal and submedian lateral spine on each side. Tibia and patella I, 5.35 mm long (tibia alone, 3.86 mm); tibia and patella IV, 4.75 mm long (tibia alone, 3.27 mm).

Tibia of the palpus wider than long (22/15), expanded retrolaterad and more or less triangular in shape, tribranchiate with the tarsus articulated to the prolateral branch. For further details regarding the structure of the palpal organ see Fig. 11.

Described from a male specimen collected by M. Broyles at Coronado Beach, Volusia Co., Florida in August, 1935 and in the possession of the American Museum of Natural History.

The genus *Tentabunda* according to the present interpretation includes also the species described as *Pseudosparianthis variabilis* Cambridge,<sup>12</sup> known from Mexico, and *Pseudosparianthis antiguensis* Bryant,<sup>13</sup> known from the West Indies. The members of *Pseudosparianthis* are distinct from those of *Tentabunda* particularly in that the anterior metatarsi are armed with two pairs of spines rather than with one pair. The genus *Pseudosparianthis* is not known to occur in the nearctic region.

#### OLIOS Walckenaer

Ins. apteres, 1: 563, 1837. Genotype: *Micrommata spongatarsis* Dufour.

Cephalothorax robust, not at all or but slightly longer than wide. Eyes in two rows, each of which may be procurved, straight, or less commonly recurved, with the anterior row narrower than the posterior. Eyes of the anterior row subequal or with the anterior median eyes slightly larger than the anterior lateral and closer to the latter than to each other. Eyes of the posterior row subequidistant and subequal or with the posterior median eyes slightly smaller than the posterior lateral. Clypeus much narrower than the diameter of the anterior median eyes. Lower cheliceral margin armed with three or four teeth. Anterior tibiae normally armed with 2-2 spines below.

#### KEY TO THE NEARCTIC SPECIES OF OLIOS<sup>14</sup>

1. Chelicerae yellowish or reddish brown, not contrasting strongly with the dorsum of the carapace.....2  
Chelicerae jet black, contrasting strongly with the dorsum of the carapace.....*O. fasciculatus*
2. Males.....3  
Females.....5

<sup>12</sup> CAMBRIDGE, F. Biol. Centr. Amer. II: 119, pl. VIII, fig. 21. 1900.

<sup>13</sup> BRYANT, E. B. Univ. Iowa Studies X: 13, pl. I, fig. 4. 1923.

<sup>14</sup> It has not been possible to place *Olios franklinus* Walckenaer because of the inadequate original description

- 3. Tibial apophysis divided into two distinct branches which are not longer than the tibia. . . . . 4  
 Tibial apophysis not divided into two distinct branches, and as long as the tibia. . . . . *O. schistus* (Fig. 10)
- 4. Distal spinose process of the tibia about two and one-half times as long as either of the branches of the tibial apophysis. . . . . *O. bibranchiatus* (Fig. 8)  
 Distal spinose process of the tibia not longer than the branches of the tibial apophysis. . . . . *O. abnormis* (Fig. 2)
- 5. Epigynal atrium much wider than long. . . . . *O. bibranchiatus* (Fig. 6)  
 Epigynal atrium as long as or longer than wide. . . . . 6
- 6. Epigynal atrium much longer than wide. . . . . *O. mohavensis* (Fig. 4)  
 Epigynal atrium about as wide as long. . . . . 7
- 7. Anterior border of the epigynal atrium with a large posteriorly directed lobe. . . . . *O. albinus* (Fig. 3)  
 Anterior border of the epigynal atrium without such a lobe. . . . . *O. schistus* (Fig. 7)

**Olios fasciculatus** Simon Figs. 1 and 9

*Olios fasciculatus* Simon. Act. Soc. Linn. Bordeaux **34**: 307. 1880.  
*Olios giganteus* Keyserling, Verh. Zool. Bot. Ges. Wien **33**: 681, pl. XXI, fig. 28, 1883.  
*Olios concolor* Keyserling, Verh. Zool. Bot. Ges. Wien **33**: 682, pl. XXI, fig. 29, 1883.  
*Olios fasciculatus* Banks, Proc. U. S. Nat. Mus. **23**: 585. 1901.  
*Olios pragmaticus* Chamberlin, Proc. California Acad. Sci. **12**: 659, fig. 102. 1924.

*Female*.—Total length, 19.00 mm. Carapace, 6.93 mm long, 7.43 mm at the widest place, 4.65 mm wide in front. Abdomen 11.78 mm long, 9.00 mm wide. Carapace irregular light reddish brown above, pars cephalica with a median longitudinal light narrow band extending from a short distance anterior to the thoracic groove to a point midway between the posterior median eyes; pars thoracica provided with a deep groove from which light bands radiate. Sides of the carapace with light submarginal bands. Chelicerae black, contrasting strongly with the carapace. Sternum and coxae light yellowish brown; labium and endites somewhat darker bearing white distal patches. Legs concolorous with the sternum being light yellowish brown without distinct annulations. Dorsum of the abdomen lighter than the carapace, grayish with brown streaks and spots, provided with a basal white mark outlined with dark which extends caudad in the form of a dark line reaching to the posterior termination of the abdomen. Venter lighter than the sides with indications of two median parallel dark lines.

Anterior row of eyes slightly recurved and narrower than the procurved posterior row (22/27). Eyes of the anterior row subequal, the anterior median eyes closer to the anterior level than to each other, being separated from each other by more than a diameter, from the anterior lateral by two-thirds of a diameter. Eyes of the posterior row subequidistant, separated by more than twice the diameter of a posterior median eye, the posterior median eyes two-thirds as large as the posterior lateral. Median ocular quadrangle slightly wider than long, slightly wider in front than behind, the posterior eyes about two-thirds as large as the anterior. Clypeus equal in height to about two-thirds the diameter of an anterior median eye. Chelicerae, 3.56 mm in length; lower cheliceral margin armed with four



teeth of which the basal two are small and weak while the distal two are large and robust, upper margin armed with two small teeth, one large and one small. Tibiae I and II with 2-2 spines below. Tibia and patella I, 11.39 mm long (tibia alone, 7.43 mm); tibia and patella IV, 9.41 mm (tibia alone, 6.24 mm).

Epigynum very small, about as long as wide with the atrium about as wide in front as behind and provided with an incomplete median septum which extends barely half-way down its length. Side pieces lightly or not at all chitinized. For further details regarding the structure of the epigynum see Fig. 1.

Described from a female specimen collected at Oracle, Arizona, July, 1898 by E. A. Schwartz and in the possession of the United States National Museum.

*Male*.—Total length, 12.00 mm. Carapace, 6.44 mm long, 6.04 mm at the widest place, 3.56 mm wide in front. Abdomen, 5.94 mm long, 3.47 mm wide. Dorsum of the carapace somewhat darker than in the female, but with the same markings. Chelicerae dark brown to black. Sternum orange brown lighter than the legs which are dark brown. Dorsum, sides, and venter of the abdomen colored as in the female.

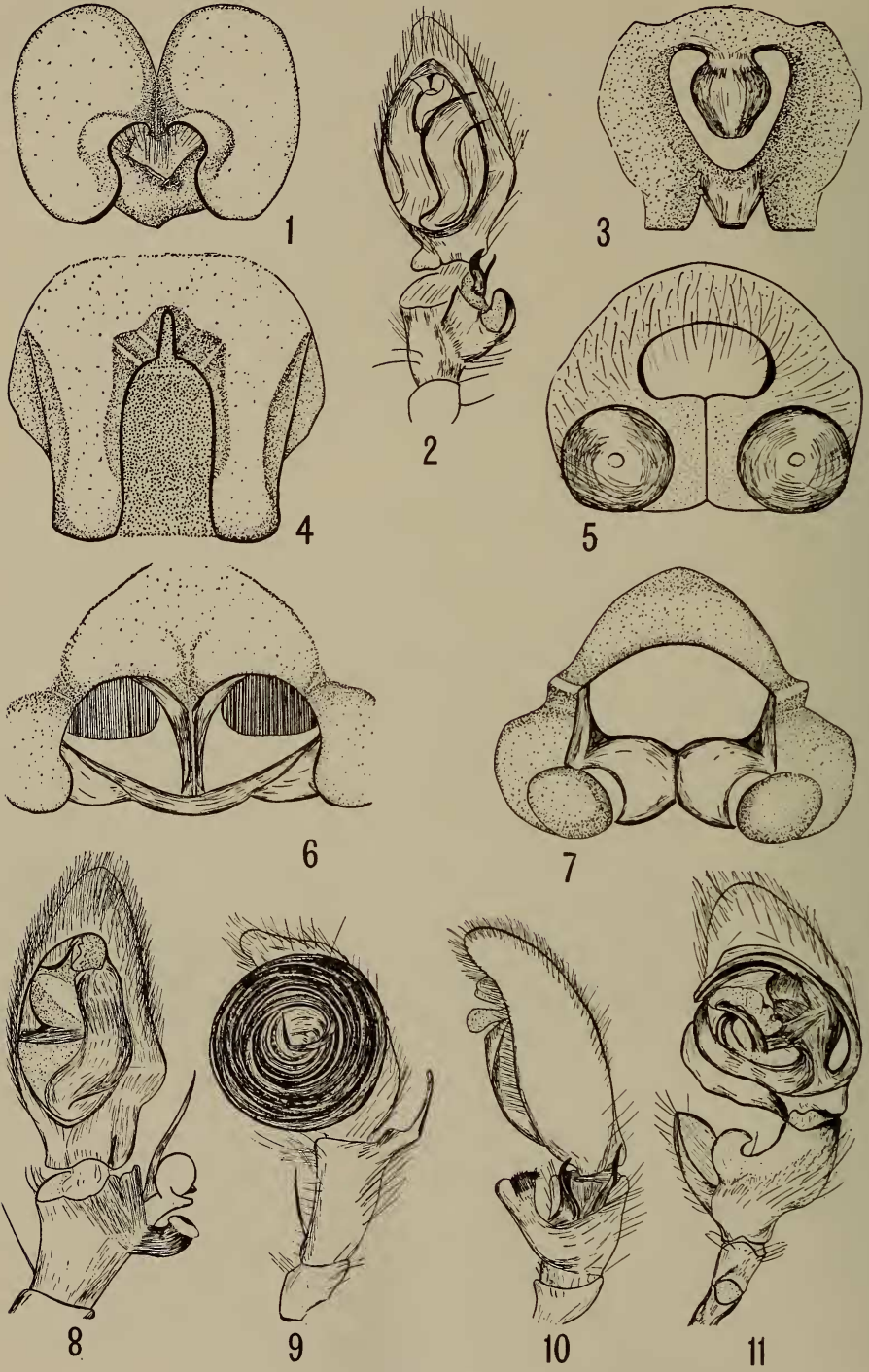
Anterior row of eyes slightly recurved or straight, narrower than the procurved posterior row (22/27). Anterior median eyes slightly larger than the anterior lateral, closer to the anterior lateral than to each other being removed from each other by one-half a diameter, from the anterior lateral by one-third of a diameter. Eyes of the posterior row subequidistant, separated by more than twice the diameter of a posterior median eye, the posterior median eyes two-thirds as large as the posterior lateral. Median ocular quadrangle about as wide as long, about as wide in front as behind, the posterior eyes two-thirds as large as the anterior. Clypeus equal in height to one-third the diameter of an anterior median eye. Chelicerae, 2.38 mm long; lower cheliceral margin armed with three robust teeth, upper margin armed with two teeth. Tibiae I and II with 2-2 spines below. Tibia and patella I, 11.48 mm long, (tibia alone, 7.92 mm); tibia and patella IV, 9.90 mm long (tibia alone, 7.13 mm).

Patella of the palpus longer than wide (11/8), tibia longer than the patella (15/11), armed with a subapical apophysis extending retrolaterad which is longer than the width of the tibia and more or less hook-like distally. The tarsus is wide and provided with an embolus that completes at least five turns. For further details regarding the structure of the palpus see Fig. 9.

Described from the holotype of Keyserling's *O. concolor*, collected at Punta del Agua, New Mexico and in the possession of the United States National Museum.

*Records*.—Arizona: Fort Yuma, immature female; Madera Canyon, Santa Rita Mountains, June, 1898, male (E. A. Schwartz, collector). Mexico: Sonora, female (H. M. Stanley, Collector); Guanajuato, two females, September 1, 1886 (Alfred Duges, Collector); Guaymas, female, (all in the United States National Museum). Utah: Zion Park, 1937, male and female (A. M. Woodbury, Collector) in the Collection of Prof. R. V. Chamberlin.; St. George, July 6, 1931, several males and females (W. J. Gertsch, Collector) in the American Museum of Natural History.

I wish to express my appreciation to Miss Elizabeth B. Bryant of the Museum of Comparative Zoology for comparing specimens of *O. fasciculatus* Simon with the paratype of *O. pragmaticus* Chamberlin.



Figs. 1-11. (See opposite page for explanation.)